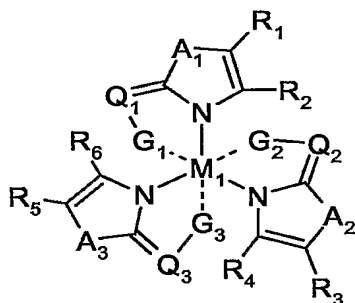


What is claimed is:

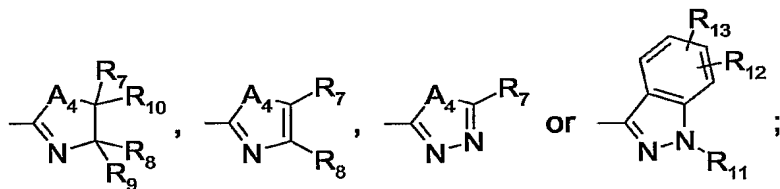
1. An optical recording medium comprising a substrate, a recording layer and optionally one or more reflecting layers, wherein the recording layer comprises a

compound of formula



(I) or a tautomer thereof, wherein

5 G_1 , G_2 and G_3 are each independently of the other



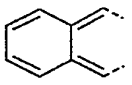
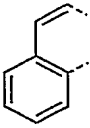
A_1 , A_2 and A_3 are each independently of the other N(R_{14}), O, S or Se and A_4 is $C(C_1-C_5\text{alkyl})_2$, $C(C_4-C_5\text{alkylene})$, N(R_{14}), O, S, Se, $N=C(R_{15})$ or $CH=C(R_{16})$;

M_1 is an at least trivalent metal of groups 3 to 15 [formerly groups IIIA to VB],
 10 preferably Co(III), Cr(III), Ru(III), Fe(III), Mn(III), V(III), Ti(III), Y(III), Mo(III), W(III), Nb(III), Rh(III), Ta(III), Ir(III), Au(III), Al(III), As(III), Sb(III), Bi(III), Sc(III), La(III), Ce(III), Pr(III), Nd(III), Pm(III), Sm(III), Eu(III), Gd(III), Tb(III), Dy(III), Ho(III), Er(III), Tm(III), Yb(III) or Lu(III), most preferred Co(III) or Cr(III);

Q_1 , Q_2 and Q_3 are each independently of the other C(R_{17}), N or P;

15 R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , R_9 , R_{10} and R_{16} are each independently of the others hydrogen, R_{18} , or C_6-C_{12} aryl, C_4-C_{12} heteroaryl, C_7-C_{12} aralkyl or C_5-C_{12} heteroaralkyl each unsubstituted or substituted by one or more, where applicable identical or different, radicals R_{18} ; or

R_1 and R_2 , R_3 and R_4 , R_5 and R_6 , R_7 and R_8 , R_7 and R_{15} and/or R_7 and R_{16} , together in pairs, are C_3 - C_6 alkylene or C_3 - C_6 alkenylene, each of which is unsubstituted or substituted by one or more, where applicable identical or different, radicals R_{19} and may be uninterrupted or interrupted by O, S or N(R_{14}), or 1,4-buta-

5 1,3-dienylene,  or , each of which is unsubstituted or substituted by

one or more, where applicable identical or different, radicals R_{18} and in which 1 or 2 carbon atoms may have been replaced by nitrogen;

R_{11} , R_{14} and R_{15} are each independently of the others C_1 - C_{24} alkyl, C_3 - C_{24} cycloalkyl, C_2 - C_{24} alkenyl, C_3 - C_{24} cycloalkenyl, C_1 - C_4 alkyl-[O- C_1 - C_4 alkylene] $_m$ or C_1 - C_4 alkyl-[NH-
10 C_1 - C_4 alkylene] $_m$, each of which is unsubstituted or substituted by one or more, where applicable identical or different, radicals R_{19} ; or C_6 - C_{12} aryl, C_4 - C_{12} heteroaryl, C_7 - C_{12} aralkyl or C_5 - C_{12} heteroaralkyl, each of which is unsubstituted or substituted by one or more, where applicable identical or different, radicals R_{18} ;

R_{12} , R_{13} and R_{18} are each independently of the others R_{20} or C_1 - C_{12} alkyl,
15 C_3 - C_{12} cycloalkyl, C_1 - C_{12} alkylthio, C_3 - C_{12} cycloalkylthio, C_1 - C_{12} alkoxy or C_3 - C_{12} cycloalkoxy each unsubstituted or substituted by one or more, where applicable identical or different, radicals R_{19} ;

R_{17} is hydrogen, halogen, cyano, hydroxy, C_1 - C_{12} alkoxy, C_3 - C_{12} cycloalkoxy, C_1 - C_{12} alkylthio, C_3 - C_{12} cycloalkylthio, amino, nitro, formyl, $C(R_{16})=CR_{21}R_{22}$,
20 $C(R_{16})=NR_{23}$, $N=CR_{23}R_{24}$, NHR_{25} , $NR_{26}R_{27}$, $COO-R_{26}$, carboxy, carbamoyl, $CONH-R_{26}$, $CONR_{26}R_{27}$, R_{28} , $N=N-R_{28}$ or R_{29} ;

R_{19} is halogen, hydroxy, $O-R_{26}$, $O-CO-R_{26}$, $S-R_{26}$, NH_2 , $NH-R_{26}$, $NR_{26}R_{27}$, NH_3^+ , $NH_2R_{26}^+$, $NHR_{26}R_{27}^+$, $NR_{25}R_{26}R_{27}^+$, $NR_{26}-CO-R_{25}$, $NR_{26}COOR_{25}$, cyano, formyl, $COO-R_{26}$, carboxy, carbamoyl, $CONH-R_{26}$, $CONR_{26}R_{27}$, ureido, $NH-CO-NHR_{25}$,
25 $NR_{26}-CO-NHR_{25}$, phosphato, $PR_{25}R_{26}$, $POR_{25}OR_{26}$, $P(=O)OR_{25}OR_{26}$, $OPR_{25}R_{26}$, $OPR_{25}OR_{26}$, $OP(=O)R_{25}OR_{26}$, OPO_3R_{26} , $OP(=O)OR_{25}OR_{26}$, SO_2R_{26} , sulfato, sulfo,

R_{28} , $N=N-R_{28}$, or C_1 - C_{12} alkoxy or C_1 - C_{12} cycloalkoxy each unsubstituted or mono- or poly-substituted by halogen;

- R_{20} is halogen, nitro, cyano, thiocyanato, hydroxy, $O-R_{23}$, $O-CO-R_{23}$, $S-R_{23}$, CHO , COR_{24} , $CHOR_{23}OR_{30}$, $CR_{24}OR_{23}OR_{30}$, R_{31} , $N=N-R_{31}$, $N=CR_{23}R_{24}$, $N=CR_{21}R_{22}$,
 5 $C(R_{32})=NR_{23}$, $C(R_{32})=NR_{21}$, $C(R_{32})=CR_{21}R_{22}$, NH_2 , $NH-R_{23}$, $NR_{23}R_{24}$, NH_3^+ , $NH_2R_{23}^+$, $NHR_{23}R_{24}^+$, $NR_{23}R_{24}R_{30}^+$, $CONH_2$, $CONHR_{23}$, $CONR_{23}R_{24}$, SO_2R_{23} , SO_2NH_2 , SO_2NHR_{23} , $SO_2NR_{23}R_{24}$, $COOH$, $COOR_{23}$, $OCOOR_{23}$, $NHCOR_{23}$, $NR_{23}COR_{30}$, $NHCOOR_{23}$, $NR_{23}COOR_{30}$, ureido, $NR_{23}-CO-NHR_{30}$, $B(OH)_2$, $B(OH)(OR_{23})$, $B(OR_{23})OR_{30}$, phosphato, $PR_{23}R_{30}$, $POR_{23}OR_{30}$, $P(=O)OR_{23}OR_{30}$, $OPR_{23}R_{30}$,
 10 $OPR_{23}OR_{30}$, $OP(=O)R_{23}OR_{30}$, $OP(=O)OR_{23}OR_{30}$, OPO_3R_{23} , sulfato or sulfo;

R_{21} and R_{22} are each independently of the other $NR_{26}R_{27}$, CN , $CONH_2$, $CONHR_{23}$, $CONR_{23}R_{24}$ or $COOR_{24}$;

- R_{23} , R_{24} and R_{30} are each independently of the others R_{31} , or C_1 - C_{12} alkyl, C_3 - C_{12} cycloalkyl, C_2 - C_{12} alkenyl or C_3 - C_{12} cycloalkenyl each unsubstituted or
 15 substituted by one or more, where applicable identical or different, halogen, hydroxy, C_1 - C_{12} alkoxy or C_3 - C_{12} cycloalkoxy radicals; or

- R_{16} and R_{23} together, R_{17} and R_{23} together and/or R_{23} and R_{30} together are C_2 - C_{12} alkylene, C_3 - C_{12} cycloalkylene, C_2 - C_{12} alkenylene or C_3 - C_{12} cycloalkenylene, each of which is unsubstituted or substituted by one or more, where applicable
 20 identical or different, halogen, hydroxy, C_1 - C_{12} alkoxy or C_3 - C_{12} cycloalkoxy radicals;
 or

- R_{23} and R_{24} together with the common nitrogen are pyrrolidine, piperidine, piperazine or morpholine, each of which is unsubstituted or mono- to tetra-substituted by C_1 - C_4 alkyl; or carbazole, phenoxazine or phenothiazine, each of which is unsub-
 25 stituted or substituted by one or more, where applicable identical or different, radicals R_{33} ;

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R₂₅, R₂₆ and R₂₇ are each independently of the others C₁-C₁₂alkyl, C₃-C₁₂cycloalkyl, C₂-C₁₂alkenyl, C₃-C₁₂cycloalkenyl, C₆-C₁₂aryl, C₄-C₁₂heteroaryl, C₇-C₁₂aralkyl or C₅-C₁₂heteroaralkyl; or

5 R₂₆ and R₂₇ together with the common nitrogen are pyrrolidine, piperidine, piperazine or morpholine, each of which is unsubstituted or mono- to tetra-substituted by C₁-C₄alkyl;

R₂₈ is C₆-C₁₂aryl, C₄-C₁₂heteroaryl, C₇-C₁₂aralkyl or C₅-C₁₂heteroaralkyl, each of which is unsubstituted or substituted by one or more, where applicable identical or different, radicals R₂₀ or R₂₉;

10 R₂₉ is C₁-C₁₂alkyl, C₃-C₁₂cycloalkyl, C₂-C₁₂alkenyl or C₃-C₁₂cycloalkenyl each unsubstituted or substituted by one or more, where applicable identical or different, halogen, hydroxy, C₁-C₁₂alkoxy or C₃-C₁₂cycloalkoxy radicals;

15 R₃₁ is C₆-C₁₂aryl, C₄-C₁₂heteroaryl, C₇-C₁₂aralkyl or C₅-C₁₂heteroaralkyl, each of which is unsubstituted or substituted by one or more, where applicable identical or different, radicals R₃₃;

20 R₃₂ is hydrogen, cyano, hydroxy, C₁-C₁₂alkoxy, C₃-C₁₂cycloalkoxy, C₁-C₁₂alkylthio, C₃-C₁₂cycloalkylthio, amino, NHR₂₅, NR₂₆R₂₇, R₂₈, halogen, nitro, formyl, N=N-R₂₈, COO-R₂₆, carboxy, carbamoyl, CONH-R₂₆, CONR₂₆R₂₇, N=CR₂₃R₂₄, or C₁-C₁₂alkyl, C₃-C₁₂cycloalkyl, C₂-C₁₂alkenyl or C₃-C₁₂cycloalkenyl each unsubstituted or substituted by one or more, where applicable identical or different, halogen, hydroxy, C₁-C₁₂alkoxy or C₃-C₁₂cycloalkoxy radicals;

R₃₃ is nitro, SO₂NHR₂₆, SO₂NR₂₆R₂₇, or C₁-C₁₂alkyl, C₃-C₁₂cycloalkyl, C₁-C₁₂alkylthio, C₃-C₁₂cycloalkylthio, C₁-C₁₂alkoxy or C₃-C₁₂cycloalkoxy each unsubstituted or substituted by one or more, where applicable identical or different, radicals R₁₉; and

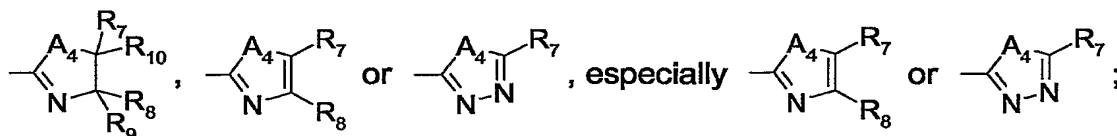
25 m is a number from 1 to 10.

2. An optical recording medium according to claim 1, wherein M1 is a trebly positively charged cation, preferably Co^{3+} , Cr^{3+} , Ru^{3+} , Fe^{3+} , Mn^{3+} , Au^{3+} , Al^{3+} , Sb^{3+} , Bi^{3+} , Sc^{3+} , La^{3+} or Ce^{3+} , most preferred Co^{3+} or Cr^{3+} .

3. An optical recording medium according to claim 1 or 2, wherein the recording
5 layer comprises a compound of formula (I) wherein

A_1 , A_2 , A_3 and A_4 are each independently of the others O, S or $\text{N}(\text{R}_{14})$ and/or Q_1 , Q_2 and Q_3 are $\text{C}(\text{R}_{17})$ or N;

G_1 , G_2 and G_3 are each independently of the other



10 R_1 , R_3 , R_5 , R_7 , R_{10} and R_{16} are each independently of the others hydrogen, R_{18} , or $\text{C}_6\text{-C}_{12}\text{aryl}$ or $\text{C}_7\text{-C}_{12}\text{aralkyl}$ each unsubstituted or substituted by one or more, where applicable identical or different, radicals R_{18} ;

R_2 , R_4 , R_6 , R_8 and R_9 are each independently of the others H, F, OH, OCH_3 , OCF_3 , CH_3 , CF_3 , C_2H_5 , $\text{C}_2\text{H}_2\text{F}_3$, $\text{C}_2\text{H}_3\text{F}_2$, C_2F_5 , CH_2OH , CF_2OH or CH_2OCH_3 ;

15 R_{14} and R_{15} are each independently of the others unsubstituted or R_{19} -substituted $\text{C}_1\text{-C}_8\text{alkyl}$;

R_{12} and R_{18} are each independently of the other halogen, nitro, cyano, O-R_{23} , CHO, $\text{CH}=\text{C}(\text{CN})_2$, $\text{CH}=\text{C}(\text{CN})\text{CONH}_2$, $\text{CH}=\text{C}(\text{CN})\text{CONHR}_{23}$, $\text{CH}=\text{C}(\text{CN})\text{CONR}_{23}\text{R}_{24}$, $\text{CH}=\text{C}(\text{CN})\text{COOR}_{23}$, $\text{CH}=\text{C}(\text{COOR}_{23})\text{COOR}_{24}$, CONH_2 , CONHR_{23} , $\text{CONR}_{23}\text{R}_{24}$,
20 $\text{SO}_2\text{C}_1\text{-C}_{12}\text{alkyl}$, SO_2NH_2 , $\text{SO}_2\text{NHR}_{23}$, $\text{SO}_2\text{NR}_{23}\text{R}_{24}$, COOH , COOR_{23} , NHCOR_{23} , $\text{NR}_{23}\text{COR}_{30}$, NHCOOR_{23} , $\text{NR}_{23}\text{COOR}_{30}$, ureido, $\text{P}(=\text{O})\text{OR}_{23}\text{OR}_{30}$, sulfo, or $\text{C}_1\text{-C}_{12}\text{alkyl}$, $\text{C}_1\text{-C}_{12}\text{alkylthio}$ or $\text{C}_1\text{-C}_{12}\text{alkoxy}$ each unsubstituted or substituted by one or more, where applicable identical or different, radicals R_{19} ;

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R₁₇ is hydrogen, halogen, cyano, nitro, formyl, C(R₁₆)=CR₂₁R₂₂, C(R₁₆)=NR₂₃, COO-R₂₆, carboxy, carbamoyl, CONH-R₂₆, CONR₂₆R₂₇, N=N-R₂₈, or C₁-C₁₂alkyl unsubstituted or substituted by one or more halogen substituents;

5 R₁₉ is halogen, hydroxy, O-R₂₆, NH₂, NH-R₂₆, NR₂₆R₂₇, NR₂₆-CO-R₂₅, NR₂₆COOR₂₅, cyano, COO-R₂₆, carboxy, CONH-R₂₆, CONR₂₆R₂₇, sulfato, sulfo, or C₁-C₁₂alkoxy unsubstituted or mono- or poly-substituted by halogen;

R₂₃, R₂₄ and R₃₀ are each independently of the others C₁-C₁₂alkyl unsubstituted or substituted by one or more, where applicable identical or different, halogen, hydroxy or C₁-C₁₂alkoxy radicals, or unsubstituted C₆-C₁₂aryl or C₇-C₁₂aralkyl; or

10 R₂₃ and R₂₄ together with the common nitrogen are morpholine, or piperidine N-substituted by C₁-C₄alkyl;

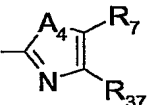
R₂₅, R₂₆ and R₂₇ are each independently of the others C₁-C₁₂alkyl, C₂-C₁₂alkenyl, C₆-C₁₂aryl or C₇-C₁₂aralkyl; or

15 R₂₆ and R₂₇ together with the common nitrogen are morpholine, or piperidine N-substituted by C₁-C₄alkyl;

R₃₁ is unsubstituted or substituted C₆-C₁₂aryl or C₇-C₁₂aralkyl, especially a metallocenyl radical; and/or

m is a number from 1 to 4.

4. An optical recording medium according to claim 1, 2 or 3, wherein the recording
20 layer comprises a compound of formula (I) wherein Q₁, Q₂ and Q₃ are C(R₁₇); G₁, G₂

and G₃ are ; and A₁, A₂, A₃ and A₄ are O, S or N(R₁₄);

R₁₄ is C₁-C₂₄alkyl, C₁-C₄alkyl-[O-C₁-C₄alkylene]_m or C₁-C₄alkyl-[NH-C₁-C₄alkylene]_m, each of which is unsubstituted or substituted by one or more, where applicable

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identical or different, radicals R_{19} , or C_6-C_{12} aryl unsubstituted or substituted by one or more, where applicable identical or different, radicals R_{18} ;

R_{17} is hydrogen, cyano, $COO-R_{26}$ or C_1-C_{12} alkyl;

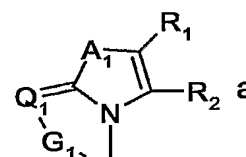
R_{18} is halogen, nitro, cyano, $O-R_{23}$, $CH=C(CN)_2$, $COOR_{23}$, ureido, $CONR_{26}R_{27}$,

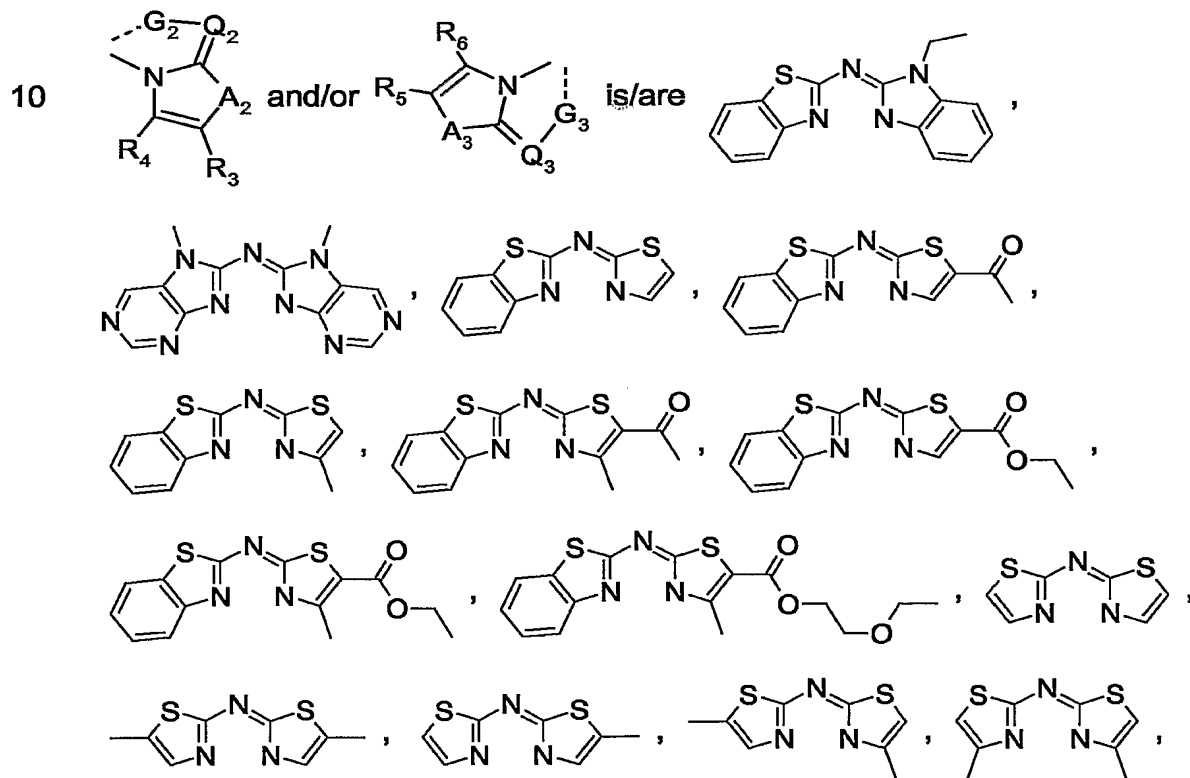
5 SO_2R_{26} , $P(=O)OR_{23}OR_{30}$ or unsubstituted or substituted C_1-C_{12} alkyl;

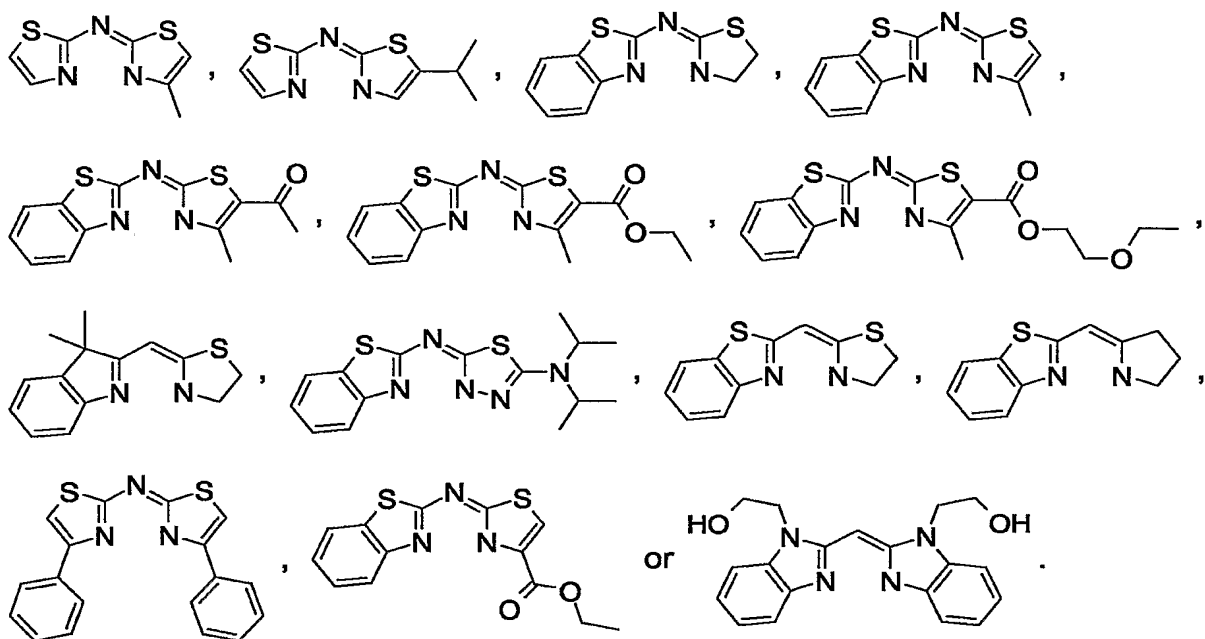
R_{19} is halogen, hydroxy, $O-R_{26}$, cyano, $COO-R_{26}$ or carboxy; and

R_{37} is H, methyl, ethyl or isopropyl, in particular H.

5. An optical recording medium according to claim 1, 2, 3 or 4, wherein the recording

layer comprises a compound of formula (I) wherein  and/or





- 5 6. An optical recording medium according to claim 1, 2, 3, 4 or 5, wherein the recording layer is substantially amorphous.
7. An optical recording medium according to claim 1, 2, 3, 4, 5 or 6, additionally comprising a covering layer, wherein substrate, reflector layer, recording layer and covering layer are arranged in that order.
- 10 8. An optical recording medium according to claim 1, 2, 3, 4, 5, 6 or 7, which in addition to comprising a compound of formula (I) comprises a metal-free chromophore.
9. A method of recording or playing back data, wherein the data on an optical recording medium according to claim 1, 2, 3, 4, 5, 6, 7 or 8 are recorded or played back at a wavelength of from 350 to 500 nm.
- 15 10. A compound of formula (I) according to claim 1.
11. A compound according to claim 10, wherein R_2 , R_4 , R_6 , R_8 , R_9 and R_{11} are hydrogen.

12. Use of a compound according to claim 10 or 11 for optical recording, preferably at a wavelength of from 350 to 500 nm.